

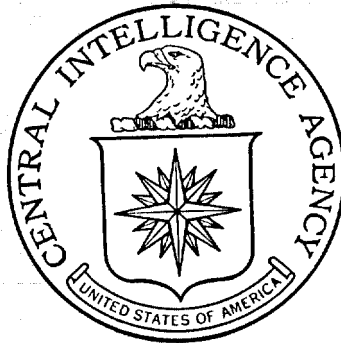
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RESEARCH AID

PLANNING DATA ON THE SOVIET GUIDED MISSILE PROGRAM



CIA/RR RA 59-14

November 1959

CENTRAL INTELLIGENCE AGENCY
OFFICE OF RESEARCH AND REPORTS

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FOREWORD

This research aid has two primary objectives. The first objective is to provide intelligence officers who are following the Soviet missile program with background information on the planning methods and managerial techniques employed by the USSR in the large-scale production effort required to bring into being an operational advanced weapons system. The second is to provide a guide to the location of information on the scope and nature of the Soviet program for production of guided missiles and the types of people who may have access to the information.

The description of the managerial techniques employed and of the interrelationships between the administrative, service, and fiscal organizations and the production units involved in the missile program is based on the combination of a limited amount of direct evidence collected through intelligence sources and a vast amount of information on Soviet economic planning, accounting, and management techniques available from overt Soviet publications. It is useful to relate this open-source information to the specific problem of missile production because such evidence as is available indicates that highly classified economic activities in the USSR are usually planned and managed in essentially the same way as nonsensitive economic activities. The principal differences lie in the security measures employed and in the higher priority for human and material resources which the sensitive activities enjoy.

No documentation is included in this research aid, because of the multiplicity of documentary sources used and the difficulty of narrowing generalized conclusions to particular sources.

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PLANNING DATA ON THE SOVIET GUIDED MISSILE PROGRAM*

Summary

Primary responsibility for the missile program** in the USSR is believed to rest with a State Committee for Guided Missiles*** of the Council of Ministers,**** acting as a staff either to the Presidium† or to the dominant member of the Soviet hierarchy.†† The missile program is in the immediate charge of either this dominant member or a member of the Presidium. Most of the proposals to create a missile system come from the Ministry of Defense,**** and the "First Branch" of Gosplan**** is believed to serve as the principal staff agency which translates policy proposals into production and construction programs and schedules. The proposals and the Gosplan staff work are reviewed by the Missiles Committee, and the final decision is taken by either the Presidium or the dominant individual referred to above. The Missiles Committee is primarily responsible for insuring that this final decision is executed.

* The estimates and conclusions in this research aid represent the best judgment of this Office as of 15 September 1959.

** The term missile program in this research aid refers to production of a number of missile systems, each of which is designed to fulfill a specific mission.

*** Also referred to throughout this research aid as the Missiles Committee.

**** All-Union throughout this research aid unless specifically referred to as republic.

† Because the same individuals almost invariably make up the Presidium of the Council of Ministers and the Presidium of the Communist Party Central Committee, this research aid uses the term Presidium to denote the top decision-making group, with the implicit understanding that major decisions may be made by a dominant individual.

†† It should be kept in mind that much of the organizational structure posited in this research aid represents only the best hypothesis that can be formed at this time with the information available. Additional information which indicates a different organizational structure is fully as welcome as information confirming the structure described herein. It should also be remembered that the present lack of positive evidence concerning the existence of a special State Committee for Guided Missiles by no means precludes the existence of such an organization.

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Developmental production for a full-scale testing program is carried out primarily in research institutes and design bureaus subordinate to the Missiles Committee or other central organs. Although local administration and economic organs are largely cut off from the normal document and information flows on the production and financing of enterprises engaged in developmental production, local organs nevertheless apparently receive production and financial information in an aggregative form on an annual or semiannual basis. Some detail on the labor force engaged in developmental production probably is available to a limited number of people in the regional councils of the national economy (sovnarkhozy*), the local branch of the State Bank (Gosbank), and the local office of the Central Statistical Administration.** A great deal of information on material supplies moving into developmental production facilities and on shipment of finished products from the production unit is available in the railroad administration. Local Party and government officials probably are largely cut off from the daily activities of a developmental production facility, but they probably would be aware of changes in the level of activity, of the initiation and completion of projects, and of the relative success or failure of a project.

Series or mass production of components for an operational system is carried out primarily in plants subordinate to the sovnarkhozy. Information in great detail on all aspects of production, production costs, funding, supply, labor force, and wage bill is reported to the defense industry administration of the local sovnarkhoz and to the defense sections of the Gosbank branch and the Central Statistical Administration. The railroads would have information in great detail on supplies to, and shipments from, the producing plants. Local Party and government officials would be quite aware of such production activity. Local trade union officials probably would have access to some details concerning the labor force and wage bill at a plant engaged in series or mass production of missile systems components. Complete details, of course, are available in the files of the producing plant and of the central authorities in Moscow. The republic Gosplan also would have access to a considerable amount of information.

Information on construction of launching sites and other operational facilities is withheld from local organs in a manner analogous to developmental production at a research institute or design bureau. On the other hand, key people in the railroads may have greater knowledge about material supplies consigned to the construction site and the nature of the installation.

Current knowledge of the missile program in the USSR could be improved greatly if there were a marked improvement in the quantity and

* Sovety narodnogo khozyaystva.

** Tsentral'noye Statisticheskoye Upravleniye.

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quality of information available on nondefense economic activity, on the definitions and methodology of certain openly published statistical data, and on less sensitive aspects of the Soviet military program. Such data, which can yield information on the missile program, may be collected not only by agent penetration but also by legal travelers.

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I. Introduction

As a guide to collection and analysis this research aid emphasizes where the desired information on the Soviet guided missile program probably may be found in the Soviet state apparatus. Obviously the information sought is in the hands of the people and the organizations which are directly involved in producing the major components and in operating the missile systems. But there are many other parts of the state apparatus, such as Gosplan, Gosbank, and the transportation organs, which in the normal course of events have access to all or major portions of the information desired.

This research aid is designed primarily to assist the direct approach to collection of information on the guided missile program; the indirect approach, however, is not ignored. The direct approach involves the collection of information from the organs which plan, control, fund, and directly operate and support production of guided missiles and the construction of missile system facilities in the USSR as well as postal, transport, and other communications facilities.

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The indirect approach involves the acquisition of information

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which itself is unclassified (or carries a low classification) but which if known in sufficient detail would permit separation and identification of military production in general, and missile programs in particular, from other activities. In other words, if enough

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were known about the nonmilitary sectors of the economy, military production could be isolated as a residual. Similarly, if enough were known about other areas of military production, the missile program could be isolated.

The probable organizational structure of the guided missile production program in the USSR is presented in broad outline in II, below.

In III, below, there is a brief survey of the probable initial planning of production, funding, and material supply for missile systems as well as the probable organizational skeleton of the missile program. It deals with the locus of decision-making on the size and nature of the Soviet missile program, the planning of production and construction, the funding (financing) of the missile program, and the planning of material supplies. Essentially the discussion of these functions is by analogy to the manner in which decisions, production planning, funding, and supply planning are made and implemented in the USSR for other high-priority items, with adaptations of the analogy to allow for the problems peculiar to missile programs.

In IV, below, an analysis is made of the relationships of an enterprise engaged in production of missiles with other major components of the Soviet state apparatus in order to determine the roles of these organizations in the production and construction of missile systems and the information they may have. An effort is made to distinguish between the information available to local branches of such organizations and the information probably available only in the central offices in Moscow.

The relationships of the producing enterprises with fiscal, planning, and statistical organs are analyzed for two levels of production. It is believed that enterprises engaged in experimental production of hardware for developmental weapons systems are of a different type from those engaged in line production for both test and operational use and that the former have much more limited contacts with fiscal, planning, and statistical organs than the latter. Hence separate treatment is given to each level of production and its relationships with other organs in the state apparatus. Developmental production is designated "Stage I," and line production is designated "Stage II."

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II. Basic Organization of the Missile Program

Although there is no direct evidence, it is believed that a special State Committee (or Main Administration) for Guided Missiles of the Council of Ministers is the center of primary responsibility for research, development, and production of missile systems and construction of operational facilities in the USSR. In its daily operations this Missiles Committee is headed by a permanent chairman who has the rank of Minister, and the committee may have one or more deputy chairmen who specialize in research and development or in production and construction problems. The chairman reports directly to the Presidium member who is in immediate charge of the missile program. It is believed that Nikita Khrushchev is personally overseeing the missile program at the present time. D.F. Ustinov, who is a Deputy Chairman of the Council of Ministers, probably is the Chairman of the Missiles Committee. It is believed that the Missiles Committee has a collegium consisting of the following members ex officio: the Chief of the "First Branch" and of the "Second Branch"* of Gosplan; the Chief of the "Summary Branch for the Defense Industries" of Gosplan; the Minister of Defense; and the Chairman of the State Committees for Defense Technology, Construction, and Automation and Machine Building (see Figure 1**).

There are two bases for positing the organizational structure in Figure 1. First, certain high-priority defense projects are known to have been administered in a similar manner; second, the problems of coordinating and managing the manufacture of operational missile system in quantity by this new industry would be so complex and day-to-day decisions would be so urgent that a strong, centralized executive authority would be mandatory.

* The official table of organization of Gosplan lists 22 functional activity branches, 19 of which are concerned with branches of industry such as ferrous metallurgy, fuels, machine building, and light industry. The only overtly listed military branch is the "Summary Branch for the Armaments Industries," which is believed to be responsible for planning the activities of industries producing more or less conventional weapons. The two remaining branches are listed simply as the "First Branch" and the "Second Branch." The aviation industry background of the chief of the "First Branch," M.V. Khrunichev, suggests that the "First Branch" is the Gosplan organization primarily responsible for the missile program. The "Second Branch" is believed to be primarily responsible for the atomic energy program. Other advanced weapons programs such as that of nuclear-powered naval craft also may be included in the responsibilities of these two branches of Gosplan.

** Following p. 6.

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It is possible that the missile program is run by a less formally organized, but equally powerful, ad hoc group (such as a "Council for Guided Missile Affairs") at the Presidium level and that the duties and responsibilities of the functional secretariat outlined in Figure 1* would be divided among the various state committees whose chairmen form the collegium posited in Figure 1. The important point here is that even if this should be the case, the functions and duties outlined must be performed by someone, and whether they are carried out by a special secretariat to a formal committee or by the various committees and organizations reporting to a less formal ad hoc Council is primarily a matter of administrative expediency. Thus, if evidence should become available which indicates a basically different organizational structure at the top level from that which is posited by Figure 1, nevertheless the discussion of what must be done and how it is done in the Soviet system probably would remain valid.

The current information available on the functions of the overtly announced state committees indicates that, unlike their ministerial predecessors, they have limited executive authority. These committees appear to have primarily advisory functions and perhaps responsibility for drafting long-range plans for their areas of activity. The State Committee for Guided Missiles, postulated in this research aid, would have considerably broader powers. The somewhat limited scope of responsibility of the other committees is one reason for considering it unlikely that any one of these committees would itself be responsible for the missile program or that they would be likely to share executive functions in support of the missile program under the direction of an ad hoc missile Council. Regardless of whether the Missiles Committee is formal or ad hoc, it must draw a considerable amount of support from the other state committees. Therefore, these committees, and the senior personnel connected with them, necessarily are important targets for the collection effort on the missile program.

The Missiles Committee should have a permanent secretariat composed of functional divisions which include the following: planning and production, finance, supply, technical research and development, cadres, construction, transport, and military liaison.

In addition to a permanent secretariat, the Missiles Committee may be expected to have a number of scientific research institutes (NII)** and design bureaus (PB/KB)*** directly subordinate to it, but probably more of the former (for example, NII 3 and NII 4) than of the latter (for example, KB 2). It is common Soviet practice for research institutes to be limited to research and development, but there is evidence

* Following p. 6.

** Nauchno-Issledovatel'skiy Institut.

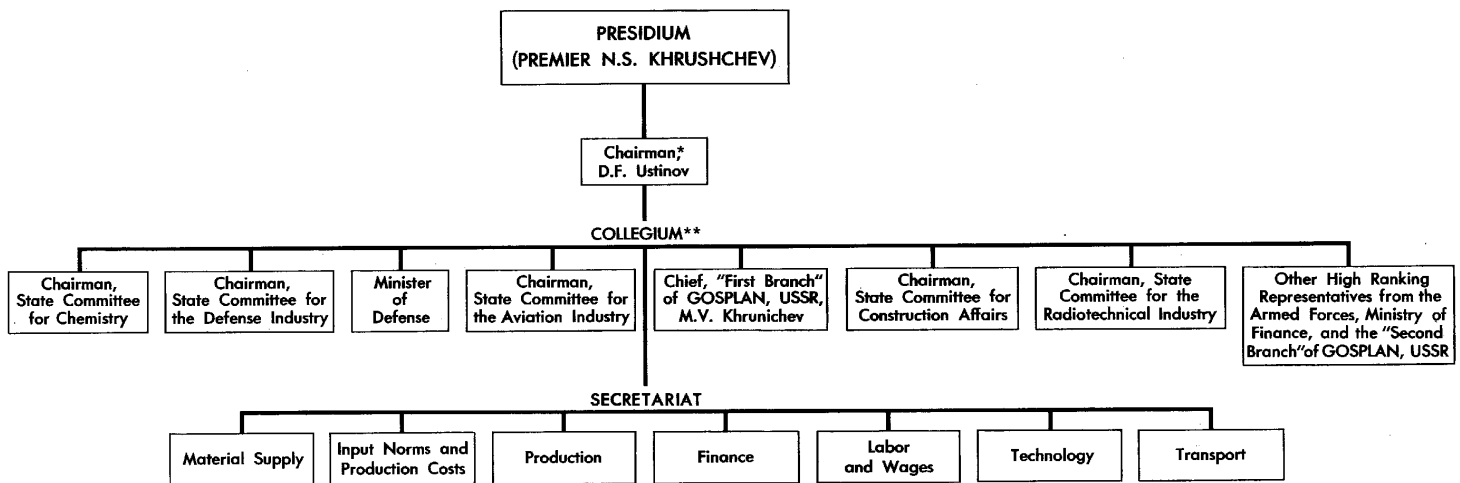
*** Proyektnoye Byuro/Konstruktorskoye Byuro.

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Figure 1

USSR: PROBABLE ORGANIZATION
OF THE STATE COMMITTEE FOR GUIDED MISSILES



* It is common Soviet practice to have several deputy chairmen, often divided into two hierarchical classes of "first" and "second." Such additional deputy chairmen often are functional department heads as well; in this case, they likely would be members of the collegium. There might well be a "first deputy" chairman for production, construction, and research and development.

** At the time of the 1957 industrial reorganization, a number of ministries (for example, the Ministries of the Defense Industry and of the Radiotechnical Industry) were retained. These ministries have gradually been replaced for the most part by the state committees, which seem to have advisory and long-range planning functions but not the executive authority of the former ministries in the day-to-day operations of plants.

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concerning the activities of NII 3 and NII 4 which suggests that, in the missile program, research institutes may have the capability for experimental shop production of major missile systems components. Normally, the primary function of design bureaus is to provide the drawings and blueprints required by the production and tool design engineers. In the case of the missile program, however, there is evidence to suggest that a design bureau may have some experimental shop facilities for production of components.

Part of the responsibility for research and development may be subcontracted to research institutes and design bureaus subordinate to the Ministry of Defense, but it is believed that the bulk of the research and development as well as production for developmental programs will be handled by facilities directly subordinate to the Missiles Committee.

Through its functional divisions and research institutes the Missiles Committee provides draft plans for production, construction costs, funding, and transport, together with technical documentation, of missile systems. These draft plans provide a major part of the necessary staff support to the Ministry of Defense for its proposals to the Presidium on the kind and scope of missile systems needed, and at the same time they serve as the primary working documents for Gosplan's planning, scheduling, and costing of the missile program. Within the Ministry of Defense the Main Artillery Administration (GAU)* is believed to be the principal organization engaged in planning the missile program. The GAU probably is responsible for working out the detailed capabilities which a missile system must have to perform a designated mission and the general technical requirements of the system elements.

Given the Presidium's decision to build a missile system and the completion of plans by Gosplan and the Ministry of Finance, the Missiles Committee would normally have primary operational responsibility

* Glavnoye Artilleriyskoye Upravleniye. The GAU is known to have these responsibilities for at least part of the ballistic missile program. If some other organization should be responsible for other missile systems, the scope of its responsibilities and its method of operation probably would be similar to that of the GAU. It is possible that a special administration has been created within the Ministry of Defense to perform the functions ascribed herein to the GAU. It is also possible that the Soviet General Staff plays an important part in proposing the types of missile systems which should be produced and that the role of the GAU is quite secondary to that of the General Staff as far as policy proposals for missile systems are concerned.

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for implementing the plans for production, construction, and installation. A great deal of the production responsibility, of course, is subcontracted to such industries as the defense industry, the radio-technical industry, and the chemical industry. In addition to operating its own production facilities for developmental systems, therefore, the Missiles Committee monitors the fulfillment of the subcontracted production responsibility for operational systems and will assist in solving any production, supply, labor, and financial problems that may arise.

The GAU, through the agency of plant representatives, probably is responsible for inspecting the final products at the producing plants to insure that the technical and quality specifications are met. The GAU probably is the agent of the Ministry of Defense which accepts the approved items.

III. Policy Planning Review and Decision

A. Policy Proposal and Review

Decisions as to which of several alternative missile systems are to be produced, the size and scope of the systems, and the resource allocations (capital equipment, material, and manpower) to be devoted can be made only by the top leadership of the USSR. If the decision is not made by one man (currently Khrushchev, formerly Stalin), it is made by the small group of men who make up the Presidium of the Council of Ministers.

The first major step in deciding the kind and size of the Soviet missile program is the Presidium's estimate of the international situation confronting the USSR and what policy lines the USSR desires to pursue. This estimate is embodied in a resolution, or in some cases in a circular letter, with a limited distribution among top Party, government, and military officials. Although these estimates routinely correspond to the period of the multiyear economic plans (5 to 10 years), shorter term resolutions may be prepared in reaction to major external or internal events (for example, an international crisis or a major change in Soviet leadership). The Presidium's estimate indicates the relative share of national income to be devoted to investment, to the military, and to consumption and assigns a hierarchy of priorities to those aspects of the total military posture (both offensive and defensive) of the USSR which need to be strengthened in order to support the policies decided upon. Within these general limits and priorities the Ministry of Defense has primary responsibility for drawing up a draft program for missile and other weapons systems designed to achieve Soviet policy objectives. Such a draft would consider the relative shares of total military procurement to be assigned to offensive and defensive

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systems as well as between missile and other weapons systems. At this stage of policy proposals, the economic cost is not a direct consideration, but the Ministry of Defense is guided by the Presidium's desire that defense expenditures should not exceed some given proportion of national income.

When the Ministry of Defense has worked out its projections for the missile program, they are submitted to the Presidium for consideration. It is likely that the Minister of Defense presents the proposed program, but there may be times when the Presidium member currently acting as overlord presents the proposals. If the technological documentation of the various systems convinces the Presidium that the program provides the desired capabilities, and if at this stage the economic cost of the program appears to be within the desired general limits, the program is referred to Gosplan -- probably to the "First Branch" currently headed by Khrunichev -- for a detailed staff study of the costs of the various systems in terms of materials, manpower, and production facilities. This may be characterized as the policy proposal and review stage of the decision-making process for the missile program (see Figure 2* for an outline of the policy proposal and review procedures).

It is likely that the Ministry of Finance and someone with construction experience -- probably a member of the Presidium with the appropriate background or the Chairman of the State Committee for Construction Affairs -- will participate in the staff study of the cost of the proposed systems. It is likely that, before submission to the Presidium, the Ministry of Defense has coordinated the cost of the various systems with Gosplan but only in general terms. Realistic planning requires Gosplan to analyze the cost of the entire missile program in detail because only Gosplan can work out the requirements of the various systems for material, plant, and manpower resources in conjunction with the demands on the same resources by other military programs; by the investment plans for industry, transport, agriculture, and housing; and by foreign trade commitments, and the like. In other words, Gosplan must strike a balance between the material and manpower resources available and the demands made on these resources. If Gosplan reports that the proposed program is too costly, that there simply are not enough resources to go around, the Presidium is faced with a number of difficult choices.

Suppose, for example, that it was proposed to create a "first strike" intercontinental ballistic missile (ICBM) force (that is, one which could destroy 90 percent or more of the US retaliatory capability if the USSR took the initiative), the estimated cost of which might

* Following p. 10.

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push the defense sector's share of national income well beyond the general limits desired by the Presidium. Obviously a "first strike" ICBM force would be very alluring to the Soviet leaders, but it hardly would be foolproof, and to undertake such a program might well require some cutback in other investment or in consumption, or both. Owing to its preoccupation with long-run growth, the Presidium is loathe to cut back investment, and consumption's share of the national product already is quite low. The Presidium also could cut back some other part of the missile program or make compensatory cuts in other parts of the military establishment.

The pattern of Soviet actions in the past indicates no routine solution to this kind of squeeze. The Soviet military establishment by no means is forced within the limits of a fixed budget, but neither does it have unlimited resources at its disposal. It can only be assumed that, when faced with the hypothetical problem set forth above, the Soviet leaders would first cut back the growth of already low living standards and then would proceed to reduce the less essential parts of the military and investment programs.

B. Policy Decision and Planning

If the proposed missile system promises to fulfill a mission required by over-all Soviet policy and if the initial staff review by Gosplan and others indicates that the cost of the program can be borne and that production is feasible, the Presidium makes the decisions necessary in order to initiate pilot line production for full-scale testing of the system and to prepare for subsequent full-scale production. This may be characterized as the policy decision and planning stage of the Soviet missile production program.

1. Production Planning

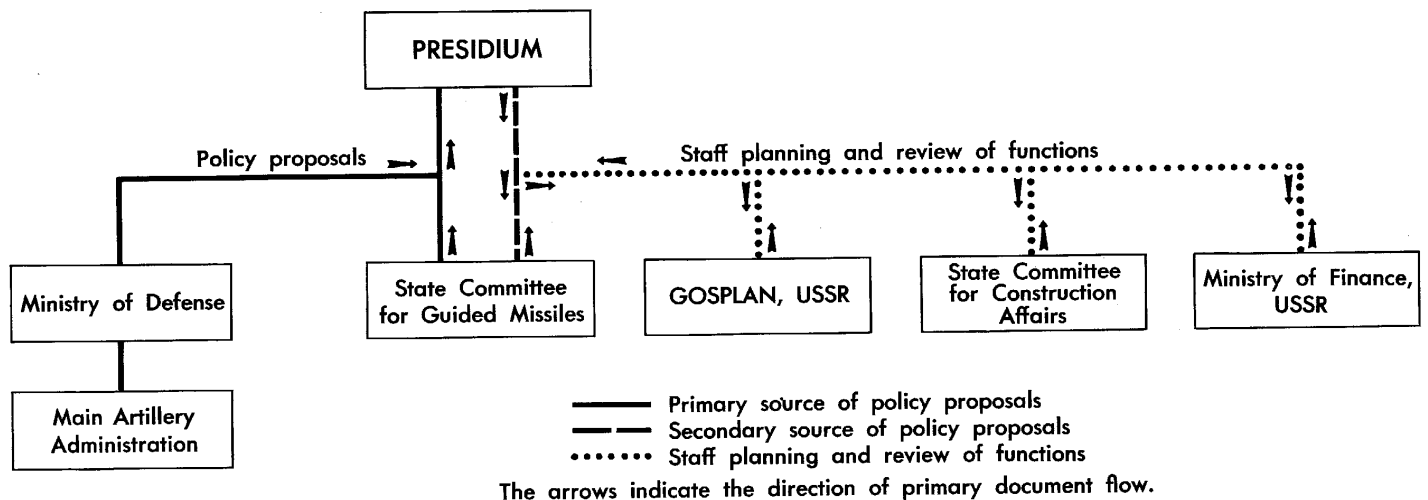
Given the decision to test and build -- unless full-scale tests belie prototype expectations -- a missile system, Gosplan and the Ministry of Finance have primary responsibility for scheduling construction and production programs, which are incorporated into the general production, construction, supply, and financial plans. The degree to which planning full-scale production and the construction of operational installations lag behind planning for pilot line production for full-scale testing depends upon the Presidium. Whether the Presidium decides to prepare for full-scale production almost simultaneously with initiation of pilot line production depends primarily on the urgency of acquiring an operational system and the seriousness of the problems which can be anticipated on the basis of prototype testing. But given the general time limits imposed by the Presidium, the "First Branch" of Gosplan is primarily responsible for

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Figure 2

USSR: PROBABLE ORGANIZATION OF POLICY DECISION-MAKING AND STAFF PLANNING AND REVIEW FOR MISSILE SYSTEMS*



**It is believed that the Main Artillery Administration through the Ministry of Defense will be the chief source of proposals for systems to fulfill the missions required by over-all policy decisions. The State Committee for Guided Missiles will be an important, but secondary, source of systems proposals. The State Committee for Guided Missiles is not responsible for proposing what systems should be produced but rather is responsible for translating the decisions of the Presidium into operational systems.*

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working out detailed production and construction schedules. In so acting, Gosplan would play its normal role of drawing up production schedules for any executive agency, basing its proposals, of course, on data submitted by the executive agency and with a good deal of coordination between Gosplan and the agency concerned.

The Ministry of Finance is responsible for financing and budgeting the program. Other agencies such as the Ministry of Defense, the State Committee for Guided Missiles, and the State Committee for Construction Affairs are assigned support and coordination roles.

Within Gosplan the responsibility for working out the detailed plans and schedules is believed to lie primarily with the "First Branch," headed by Khrunichev, and to a lesser extent with the "Summary Branch for the Defense Industries."

In planning production of missile system components, Gosplan must survey the suitable plants in order to decide where the items can be produced, where unutilized plant space may be available, where conversion of a plant would be either necessary or desirable, and the amount of new plant construction which has to take place. This must be done not only for assembly of the final products but also for major components.

Gosplan then draws up a detailed production schedule assigning responsibility for production (according to the appropriate technical specifications) of end items and components to various organizations and individual plants. Individual plants, of course, rarely receive specific production schedules earlier than the fourth quarter of the year preceding that in which production is scheduled to take place. Details of the production schedules of the final product beyond a time horizon of 1 year are retained in the upper echelons. A considerable amount of preparation and tooling, however, may occur 1 to 2 years in advance of actual production. Furthermore, production of component parts for full-scale production of a missile must begin 1 to 2 years in advance, and the final assembly plant probably has access to component supply plans possibly as much as 6 months in advance of production of the end item.

Construction of producing plants and launching installations constitutes a noteworthy exception to this limited time horizon for disseminated production plans. The current accounts of a construction organization as well as the initial documentation -- the "title list" -- indicate the total expenditures planned for the project from its initiation to completion. Thus, for example, the current account of a construction organization engaged in building a launching site or major storage and maintenance depot would provide not only information on the current level of activity but also fairly complete information on

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the final size and capability of the site or depot. Each construction organization has a current account with the local branch of Gosbank.

Gosplan draws up the construction schedule for new plants required to produce the systems components and for facilities to operate the system. In the case of new plants, Gosplan specifies the over-all size, capacity, and cost of the plant; the details then are worked out by a "project institute" which specializes in planning industrial plants, probably an institute subordinate to the State Committee for Construction Affairs. Gosplan also incorporates the schedule for production of operational facilities into the general construction plan and assigns responsibility to appropriate organizations which probably are subordinate to the Ministry of Defense and to the State Committee for Guided Missiles.

In drawing up the schedules for production of system components and construction of facilities, Gosplan would rely heavily on the draft plans for production and construction submitted by the State Committee for Guided Missiles which in turn are based to a considerable extent on the plans submitted by each enterprise engaged in the missile program. The draft plans submitted by the State Committee for Guided Missiles are based on a policy decision (to test and build a particular system) of the Presidium (discussed above) and represent the translation of this decision into draft production assignments for individual plants together with estimates of material and labor inputs. Gosplan is not, however, bound by such draft plans but, subject to the approval of the Presidium, makes such changes as are deemed necessary in view of investment plans as a whole and the general availability of manpower and materials. In the final analysis, any major controversies which may arise can be settled only by the collective dictatorship or by the dictator.

2. Cost Estimating

After the decision has been made as to the amount of plant capacity and new construction required, Gosplan will plan the production costs of the missile system components. Production cost (sebestoimost') represents the sum of all material inputs (metals, fuel, power, semifabricates), labor inputs, and a low amortization charge per unit of output. For the most important material inputs, Gosplan will set the "norms" -- that is, so many kilograms of each material per unit of output. Norms for labor inputs also are estimated (on an hourly basis). The input norms are then priced at prevailing wholesale prices and wage rates, amortization is estimated, and the result is the sebestoimost' of the item. Production costs are scheduled to decline as volume of output increases and as the workers gain experience in producing the item. Gosplan sets the price of the item by adding a low rate of profit, probably 3 to 5 percent of the production cost.

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After the input norms have been set, unit production costs estimated, and initial prices assigned to component and final products, the material inputs required to produce the planned quantity of end items must be entered into the material balances and schedules for delivery to the producing plants. The material balances calculated by Gosplan are roughly analogous to a system of double entry bookkeeping. Planned production of materials and capital equipment appear on one side, input requirements for planned production on the other. Realistic planning requires a balance between supply and requirements, hence the capital equipment and materials required to produce the missile system components must be entered into the material balances of Gosplan. Furthermore, each year a "distribution plan" is drawn up which includes, together with all other material flows in the economy, the specific quantities of materials and capital equipment which must be provided to the producers of missile system components in accordance with the producers production plan and the input norms.

Following similar procedures, Gosplan, with the participation of the State Committee for Construction Affairs and the Ministry of Defense, plans the cost of construction for all the installations, such as launching sites and storage and maintenance depots, which are required for operational missile systems. The material balances and the distribution plan, therefore, must include not only the allocations of capital equipment and material inputs to the production facilities but also the allocations of cement, steel, other building materials, and capital equipment to the construction sites of operational installations.*

* The planning system described above is the Soviet alternative to the price-market mechanism, an alternative which they have developed in response to the problems arising from the continuous Soviet drive for high growth rates and a strong military posture. Basically the Soviet allocational mechanism is a more highly developed version of the system of direct allocation of material resources which largely replaced the price-market mechanism in the West during World War II. Because the entire Soviet economy is planned and managed on this basis, and is particularly adaptable to dealing with the problems of defense production, it seems quite clear that the USSR would not seek, or be able to find, an alternative method for dealing with missile production.

It is recognized that all plans for the cost of constructing launching sites and the like are estimates in the sense that they refer to the future and in the sense that there may be radical changes in the nature of the installations required between planning and completion. Nevertheless, it is proper to speak of "plans" in this context because in the USSR the targets set by the central authorities are given the status of law and the organizations charged with [footnote continued on p. 14]

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Although the Soviet planners attempt to set precise material, labor, and capital norms for large-scale production and for construction of new plants and launching sites, developmental production costs can be estimated only crudely. Because labor costs form a larger share of developmental production costs and because highly skilled people are involved, some serious attempt to estimate labor inputs might be made. Special tooling requirements also may be estimated with some degree of preciseness. But beyond this, developmental production costs are estimated only in the form of a planned grant from the budget to the research institute or design bureau.

3. Financial Planning

After production and construction costs have been estimated in terms of physical inputs and man-hours, the missile program must be incorporated into the financial plan. The Ministry of Finance must provide the funds required to expand existing production facilities, to build new plants, to construct launching and storage installations, and to provide any special transportation and communications facilities required. These funds come from the budget allocations for capital investment. The Ministry of Finance also must provide supplementary working capital from the budget to production and construction organizations; provide financial allocations to those production organizations which are financed directly from the budget; and provide for wage, administrative, and other payments through the banking system. Finally, the Ministry of Finance must budget the funds necessary to finance procurement of the end items by the military establishment. Such procurement, however, probably is not paid for out of the explicit defense budget.

4. Transport Planning

Owing to special problems involved in the transport of missiles, fuels, and other components, it is likely that a special transport plan has been worked out in Gosplan with the participation of the transport branch of the State Committee for Guided Missiles and of the Ministry of Defense through its military transport organization (VOSO)* in the railroad administration. In the case of transport planning, Gosplan will not take part in the supervision of movements but will restrict itself primarily to planning the cost of transport for the

implementing the plans must obtain formal approval in detail from the central authorities for any changes in the plan. Furthermore, the available resources are stretched to the point at which any changes in the plans which involve substantial resource shifts directly affect not only the area of activity in which the original change occurred but also many other areas of economic activity.

* Voyennyye Soobshcheniya.

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missile program and to making the necessary resource allocations. Close control over the actual movement of missiles, fuels, and major system components will be exercised by the Missiles Committee and/or the Ministry of Defense through VOSO in the transport administration -- rail and/or water. Because the transport plans for moving major missile system components are worked out in great detail and for as much as 1 year in advance, security considerations dictate that the details of planned movements probably are passed down to the operating divisions of the railroads (or of water transport) only a few days in advance.

It is likely that the documents covering such transport movements -- documents which will contain a great deal of detail on the quantity, value, and designation of the shipments -- will be handled primarily by VOSO in the transport administration. But many ordinary workers would know at least the number and type of vehicles involved and the general geographical area of destination.

C. Summary of Policy Proposal and Planning

At this point the Presidium has decided what systems are to be brought into the developmental-testing stage and what missile systems are to go into the operational status. The second phase in the decision-making process is the Presidium's decision on the staff proposals to bring the systems into being, staff proposals prepared by Gosplan with the participation of the Missiles Committee and other organizations described above. The plans laid before the Presidium include the following: (1) assignment of production responsibility to individual plants, planned construction of new production facilities, and planned construction of launching sites and other construction required for operation of various systems; (2) detailed cost estimates for production of principal components of the missile program and for construction of new production facilities and of operational installations, and rough estimates of developmental costs of systems still under consideration; (3) planned allocations of funds from state budget to cover construction and developmental production outlays, and procurement of end items by the military establishment; and (4) special transport movements and facilities required.

Review and approval of these staff proposals is the final policy decision, and fulfillment of the assigned tasks is then obligatory for all subordinate organizations concerned. The next problem is to get the plans translated into end items and installations, which may be characterized as the third, or operational, phase of the decision-making process in the missile program.

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IV. Operational Planning and Control of Production and Construction of Missile Systems

The third phase of the decision-making process consists of the day-to-day planning and control of production, construction, funding, supply, procurement, and transport. As information on these matters is necessarily much more widely diffused throughout the USSR, more attention will be given to the details of day-to-day operational planning and control in order to illustrate not only how the missile production program will operate but also what kind of information about the missile program is to be found in various Soviet financial, statistical, and planning institutions.

The objective of this section is to set forth the daily and continuing relationships between producing plants and construction organizations with the planning, financial, statistical accounting, and other organizations of the Soviet economic apparatus as well as the relationships of plants and construction organizations to their respective higher organs in the administrative chain of command. Plant relationships to other organizations will be grouped under four functional headings: production planning and reporting, financial accounting, supply and shipment, and labor force and wage bill. This procedure will permit analysis of the amount of information about plant production and financing, for example, which is available to the local branches of the Gosbank and to the local organs of the Central Statistical Administration.

As indicated previously, plant relationships with other organs will be examined for two phases of production: experimental shop production for systems testing (Stage I production) and series or mass production for an operational system (Stage II production). Construction of production facilities and construction of launching and other installations required for operational use also will be discussed.

It is believed that the State Committee for Guided Missiles makes the day-to-day decisions and exercises operational control over production of missile system components at both the pilot line and full-scale stages.* In fulfilling these functions the Missiles Committee has the

* It has long been a characteristic of the Soviet system that individuals as highly placed as Presidium members become involved in decisions at the lowest level to a degree that is almost incredible to an outside observer. The new system of territorial organization and the increased authority of the republic organs represents a move away from this time-honored Soviet practice. For a high-priority activity, such as the missile program, where timely decisions would be mandatory, however, it is likely that the central authorities continue to be intimately involved in day-to-day decisions.

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staff support from, and the assistance of, the State Committee for Defense Technology, Gosplan, the Ministry of Finance, and possibly others such as the State Committee for Construction Affairs. The probable organizational structure at Stage I, developmental production, is set forth in Figure 3.* As described here the State Committee for Guided Missiles is, in effect, a special executive committee of the Council of Ministers. As such its authority is far greater than that of the "State Committees" which have replaced previous ministries.

A. Stage I Production: Developmental Production at a Research Institute or Design Bureau

Information on production of missile system components at a research institute or design bureau probably is very closely held, perhaps known only to the State Committee for Guided Missiles, the "First Branch" and certain sections of the "Summary Defense Industry Branch" of Gosplan, the Presidium, and the Ministry of Defense. It is possible that the defense section of the Central Statistical Administration and a few people in the economic section of the Central Committee Secretariat have access to information on planned developmental production. Certainly the defense section of the Moscow office of the Central Statistical Administration receives detailed information of actual production at the end of each year, and of course those who have access to the plan also would have access to actual production. But it is likely that the local offices of Gosplan, the Central Statistical Administration, and Gosbank are cut off from information on planned and actual production at the developmental production stage (see Figure 3).

The railroad administration at all levels** has access to a good deal of important information on planned and actual production of missiles, and probably other major components of a missile system, at any and all stages of production. Shipments of material supplies to the missile plants are included in the transport plan which specifies in detail the nature of the shipments, the weight, number and kind of rail cars, and the scheduled movements for each day. These plans are made up for quarterly periods, with monthly and daily breakdowns by

* Following p. 18.

** The term railroad administration is used in this research aid in a broad sense which includes all echelons of railroad management from the ministry down to the local yard. This broad definition is employed in order to indicate that relevant information exists at virtually all levels. Railroad administration as used herein, therefore, is not to be confused with the narrower Soviet term of glavnoye upravleniye (translated as either Chief Directorate or Main Administration) which may be used in connection with a particular rail line or with a particular managerial function.

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plant. Normally the transport plan is available in the railroad division office and in the transport administration of the regional sovnarkhoz 3 weeks before the beginning of the quarter. The plant receives the coordinated copy of its transport plan 2 weeks before the beginning of the quarter. It is likely that material supplies for a plant engaged in the missile program appear in the transport plan in a more or less normal manner, although the specifications of the inputs probably are closely held in many cases. Material supplies consigned to a research institute or design bureau normally do not carry the name of the installation but only a post box number and the name of the nearest city. Most of such material inputs probably are handled by the Main Administration for Interrepublic Supply of Armaments and Radiotechnical Industries, which is subordinate to Gosplan.

Shipping of the finished product presents a somewhat different problem. Large missiles require special cars, and even small ones may require special handling procedures in movement. The shipment of major, finished components from the plant is planned by Gosplan and monitored either by the State Committee for Guided Missiles or by the Ministry of Defense through its VOSO organization. Information on planned movements of finished components and missiles probably is withheld from the railroad administration as long as possible, but the local railroad people almost certainly receive the information on scheduled movements 1 to 3 days in advance. More importantly, records of the number of cars, the kinds of cars, the tonnage, and the post box number and nearest large city of the consignee are available in the local railroad office and in the transport administration of the sovnarkhoz. Such records, of course, are handled by special sections responsible for planning, controlling, and guarding the movement of sensitive cargoes, probably VOSO in the case of missile systems final components. Nevertheless, it is virtually impossible to conceal the nature and the quantity of the cargo or the location and designation of producer and consumer from a number of people in the railroads as well as in river transport.

Truck transport probably plays a much smaller role in missile production compared with rail transport but may be quite significant in the deployment of operational systems. Owing to the decentralized organizational structure of truck transport, however, it is unlikely that a plan for truck transport is worked out by the central planning authorities. The role of truck transport in the operation of a plant or construction organization is considered in C, 1, below.

Capital construction (expansion of plant and facilities) carried on by a research institute is known to the local branch of the Construction Bank (Stroybank), USSR. The local branch of the Stroybank, however, probably knows only the total amount budgeted and spent for capital investments without the normal detailed breakdown of the expenditures.

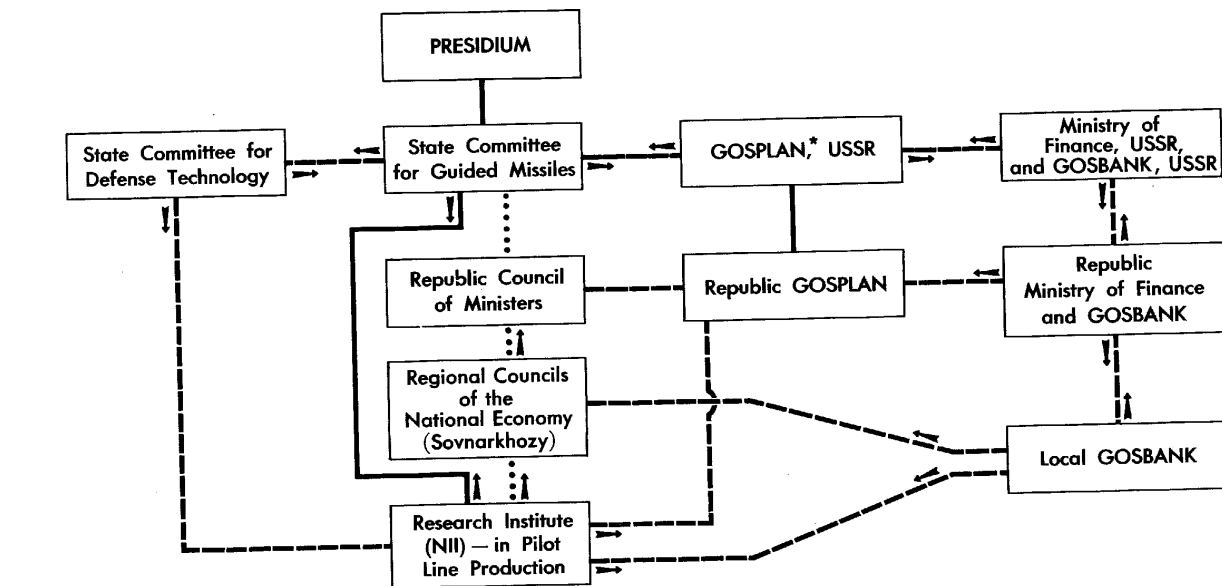
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Figure 3

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USSR: STAGE I PRODUCTION: PROBABLE STRUCTURE OF OPERATIONAL CONTROL OF DEVELOPMENTAL PRODUCTION FACILITIES OF A MISSILE SYSTEM



- Direct chain of command for decisions on all major aspects of production
 - - - Indirect chain of command for staff planning and control and financing of the missile program
 - Minor administrative matters
- The arrows indicate the direction of primary document flow.

** Actually the place of Gosplan in the hierarchy falls between the Presidium and other organizations listed here, in that Gosplan is a staff for the Council of Ministers, USSR. Gosplan has been depicted on the same level as the other committees and ministries merely for purposes of presentational convenience.*

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1. Production Goals

Production assignments to a research institute or design bureau would be made in two ways. In most cases the assignment of developmental production tasks would be assigned by the Presidium acting on recommendations by Gosplan and the State Committee for Guided Missiles. In some cases the research institute would submit proposals based upon some new or unforeseen development in its work. These proposals are reviewed by the Missiles Committee, Gosplan, and other central agencies as appropriate, and the Presidium's decision transmitted to the institute or design bureau. All production assignments are in the form of decrees of the Council of Ministers.

2. Funding

In most instances, research institutes or design bureaus engaged in developmental production are budget-supported organizations rather than khozaschet (economic accountability) organizations. Thus a research institute receives a budget grant covering its total expenditures and then returns all receipts to the budget. A khozaschet organization, on the other hand, normally is expected to cover all its operating expenses from its income; it pays profits and taxes to the budget but usually receives from the budget only funds for capital investment. It is possible, however, that some research institutes and design bureaus are on a khozaschet basis rather than operating on the basis of budget grants. Furthermore, even a budget-supported organization may be on a khozaschet basis for certain special contract work which is auxiliary to its principal production. In this case a budget-supported organization would have both a current account (tekushchyy schet) and a settlement account (raschetnyy schet) with the local Gosbank.

The expenditures for a budget-supported organization are planned on the basis of an estimate (smeta) which specifies expenditures for: (a) wages, salaries, and social insurance deductions; (b) material purchases; (c) administrative and overhead expenses; and (d) capital construction and repair of capital equipment. Estimates for expenditures other than labor are based on input norms valued at prevailing prices. Labor costs are estimated on the basis of the number of people to be employed and the wage and salary scale. A smeta is prepared by the institute each year and forwarded to its superior organizations for review. Gosplan, and probably also the Ministry of Finance, participate in the review. When approved the smeta for each research institute is incorporated into the financial section of the national economic plan and into the Soviet budget. The Ministry of Finance directs Gosbank and the Stroybank to disburse the budgeted sums.

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All expenditures of a budget-supported research institute producing missile system components are financed from the budget grant which is paid out through the institute's tekushchyy schet at the local branch of Gosbank. Because budget-supported organizations, unlike khozaschet organizations, normally do not have a raschetnyy schet, the bank does not have available to it a detailed breakdown of the institute's transactions -- that is, the bank does not have a record of each purchase and sale showing quantity, price, purchaser, transport arrangements, and the like. The tekushchyy schet shows the gross purchases and gross receipts of the institute, and it probably shows wage and salary payments separately from other expenditures, but no additional details. Furthermore, a research institute or design bureau may have its account charged to a post box number in order to make identification difficult.

The tekushchyy schet is carried in a special defense section of Gosbank which handles the accounts of all sensitive activities -- other defense plants, state reserves, atomic energy, and probably the accounts of military and police organizations. These special sections exist at every level of Gosbank and the Stroybank as well as in other similar organizations such as the Central Statistical Administration, from the lowest field office to the central office in Moscow. Other than special section personnel, only the Director, Deputy Director, and the Chief (Senior) Bookkeeper of each branch normally have access to the accounts of the special section in a field office. On the other hand, the senior people in other sections very likely know the total transactions of the bank as well as the totals for the nonsensitive sectors; hence they probably could make a good estimate of the total turnover in the special section. Although the expenditures and receipts balances of the special section accounts would fall somewhat short of ideal information about missile production because the accounts would include other activity, the balances from these accounts would nonetheless be extremely useful information.

3. Material Supply

In the procurement of material supplies a research institute engaged in output of missiles probably deals largely with the supply section in the secretariat of the State Committee for Guided Missiles. The latter has the material allocations approved by Gosplan and the Presidium for the institute's production program and probably is primarily responsible for arranging delivery of supplies. In this capacity the supply section, not the institute, deals with the suppliers and makes all the necessary arrangements. Thus the supply section contracts for steel delivery with the Main Administration for Ferrous Metals Sales attached to the Gosplan of the republic in which the institute is located. The Metals Sales Administration in turn arranges

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for a steel plant to make the requisite shipment to a post box number which may represent either the supply section of the Missiles Committee or the research institute itself. In either case the Metals Sales Administration and the steel plant would know only the general location of the post box -- that is, which city it is in or near -- and that the consumer is connected with some kind of military production. Procurement of other material and fuel requirements would be handled in a similar manner.

Procurement of highly fabricated components such as electronic equipment probably shows some significant differences in pattern. As in the case of materials the research institute would channel its request to the supply section in the Missiles Committee which in turn would contact the Main Administration for Interrepublic Supply of Armaments and Radiotechnical Industries. Owing to the specialized nature of many components and the strict technological conditions imposed, however, the research institute probably has direct contact -- personal as well as via communications -- with the electronics plant. Whereas the shipment when it leaves the electronics plant also is simply addressed to a post box number, a number of people at the electronics plant know the purpose for which the equipment is to be used. Personnel of the Main Administration for Interrepublic Supply of Armaments and Radiotechnical Industries probably are quite knowledgeable about many aspects of the missile program. Furthermore, a knowledgeable individual who knew the flow of specialized electronics equipment or components into the institute might well be able to estimate the missile production rate.

4. Transport

As has been pointed out above, the special problems usually involved in shipping missiles require specially adapted rail equipment and special handling on the part of the railroads. Information about rail shipments, if sufficiently detailed and comprehensive, therefore, could provide the basis for accurate missile production estimates and hence the basis for estimating the entire missile systems program. Information on planned and actual movement of rail cars from plants to sites undoubtedly exists in the railroad administration in considerable detail. Furthermore, the number of people in the railroads and in river transport, from the top administrative echelons down to the local yard, who have direct or indirect access to the information probably is quite large.

5. Labor and Wages

As wage and salary payments constitute the bulk of a Soviet enterprise's expenditures, which actually are made in cash, the tekushchyy schet of a research institute with the local Gosbank very likely is

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broken down to show wage payments as contrasted to all other expenditures. Indeed, if only the wage and salary portion of this account were known, a fair estimate of the total economic activity of the institute could be made. It is also possible that the local trade union organization would have access to the labor force and wage bill figures for every installation in the area.

For a producing plant the value of output could be computed rather accurately if only the wage bill for a given period were known. If this degree of detail were withheld from the local trade union organization, it is still virtually certain that the trade union organization would know the total labor force and wage bill for its area and the subtotal for all nonsensitive enterprises. Changes or shifts in the subtotal for sensitive enterprises would be very useful information.

6. Other Relationships

It is likely that local Party organizations and local government organs (rayobkom and rayispol'kom) would now have rather limited access to information concerning the activity of a research institute or design bureau engaged in developmental production of missile system components. Senior officials in the local Party and state organs probably would know what the institute was producing in a general way, and it is possible that senior Party officials would have access to production information from time to time. It is quite certain, however, that Party officials would be aware of changes in the tempo of activity, when a new program started and an existing program was dropped, and would have some information on the success or failure of a program.

The Ministry of Finance, the Commission for Soviet Control, and the Central Statistical Administration normally carry out inspections of enterprise operations and censuses of enterprise material inventories and capital stock. A research institute probably would not be exempt from such checks, but it is quite likely that the inspections would be made by a special team sent out from Moscow rather than by the local finance and statistical organs as is normally the case.

As has been pointed out above, the local offices of the Central Statistical Administration do not receive a production accounting in physical units from a research institute producing missile system elements. Production data aggregated in value terms, however, are transmitted to the oblast branch, and full details are reported to the special section of the Central Statistical Administration in Moscow. These information and document flows are outlined in Figure 4.*

* Following p. 22.

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USSR
STAGE I PRODUCTION: OPERATIONAL PLANNING AND CONTROL
Information and Document Flows



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B. Stage II Production: Serial Production Facility

Although all day-to-day decisions above the plant level regarding production, supply, funding, or labor force are believed to be in the hands of the State Committee for Guided Missiles for Stage I production, in the case of Stage II production the Missiles Committee operates primarily through the normal administrative chain of command as set forth in Figure 5* (contrast with Figure 3**) and deals directly with the producing plants only in exceptional, urgent matters.

Plants engaged in full-scale production have a number of characteristics which are different from those of research institutes in general and research institutes subordinate to special committees attached to the Council of Ministers in particular. The first and most important difference is that the plants are on a khozraschet basis -- that is, their income must cover their current operational expenditures in contrast to a budget-financed research institute. As a consequence, information about production and construction activity in plants of the defense, aircraft, chemical, and other industries is available in great detail in Gosbank, the Central Statistical Administration, and the sales and supply organs.

A second major difference is the relationship of such plants to the sovnarkhozy. For those industries where the ministry has been abolished or replaced by a Committee -- for example, defense and aviation -- the sovnarkhozy play a primary administrative role. Research institutes subordinate to the State Committee for Guided Missiles, however, probably have only very nominal relationships with the local sovnarkhozy. Furthermore, research institutes of this type tend to be concentrated in the Moscow and Leningrad areas. Research institutes and design bureaus in the aviation and defense industries probably are directly subordinate to the respective State Committee in Moscow and have only nominal relationships with the sovnarkhozy.

Owing to their different characteristics, therefore, information on plants engaged in series production of major missile systems elements is available in many more places and in greater detail than information concerning pilot line production at research institutes. The kind of information and its institutional location may be determined by an analysis of a plant's relationships with other organs of the Soviet bureaucracy in the course of production planning and accounting, financing, material supply, and other activities.

* Following p. 24.

** Following p. 18, above.

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1. Production Planning and Reporting

The basic planning document of a khovraschet enterprise is the so-called "technical-industrial-financial plan," which specifies in great detail the planned production (in physical units and in value terms), unit production costs, financial arrangements, material supply and efficiency in use thereof, labor force, labor productivity, wage bill, and technological innovation. Planned construction activity appears in this plan in a summary form; the primary documents for construction activities are the so-called "estimate" of cost and the "title list" of activity.

Production planning for an item already being produced begins with the proposed production schedule forwarded by the plant in its technical-industrial-financial plan which is prepared each year. The proposed schedule, of course, follows closely the "control figures" previously circulated by higher authority. New products are assigned to the plant in the form of a production quota which the plant must fulfill unless it can convince the higher echelons that the assigned goals are beyond the plant's capabilities, in which case the higher authorities may provide for expansion of the plant's facilities or reduce the quota.

From the plant the technical-industrial-financial plan is forwarded for review to the defense section of the sovnarkhoz in which the plant is located. Following review and approval, which would be largely a formality in the case of missile production, the plant plan is forwarded to the defense sections of the republic Gosplan and Council of Ministers. The function of these regional and republic agencies with regard to the plans submitted by plants engaged in the missile program is primarily that of a transmission belt to the center. They are listed here only to point out that the relevant documents pass through the classified sections of these intermediate agencies on the way to Moscow.

In Moscow the State Committee for Defense Technology probably consolidates the proposed plans for missile system element production from all subordinate plants and forwards the consolidated draft plan (probably with the technical-industrial-financial plans for each plant attached as appendixes) to the State Committee for Guided Missiles for review and presentation to the Presidium. At each level up to this point the plan has undergone some critical review, largely limited to paring material inputs and to raising labor productivity goals. When the consolidated plan reaches the Missiles Committee, it is examined in detail by the Committee secretariat in close coordination with Gosplan. Here again the efficiency targets may be raised, but the production targets also may be changed -- either in accordance

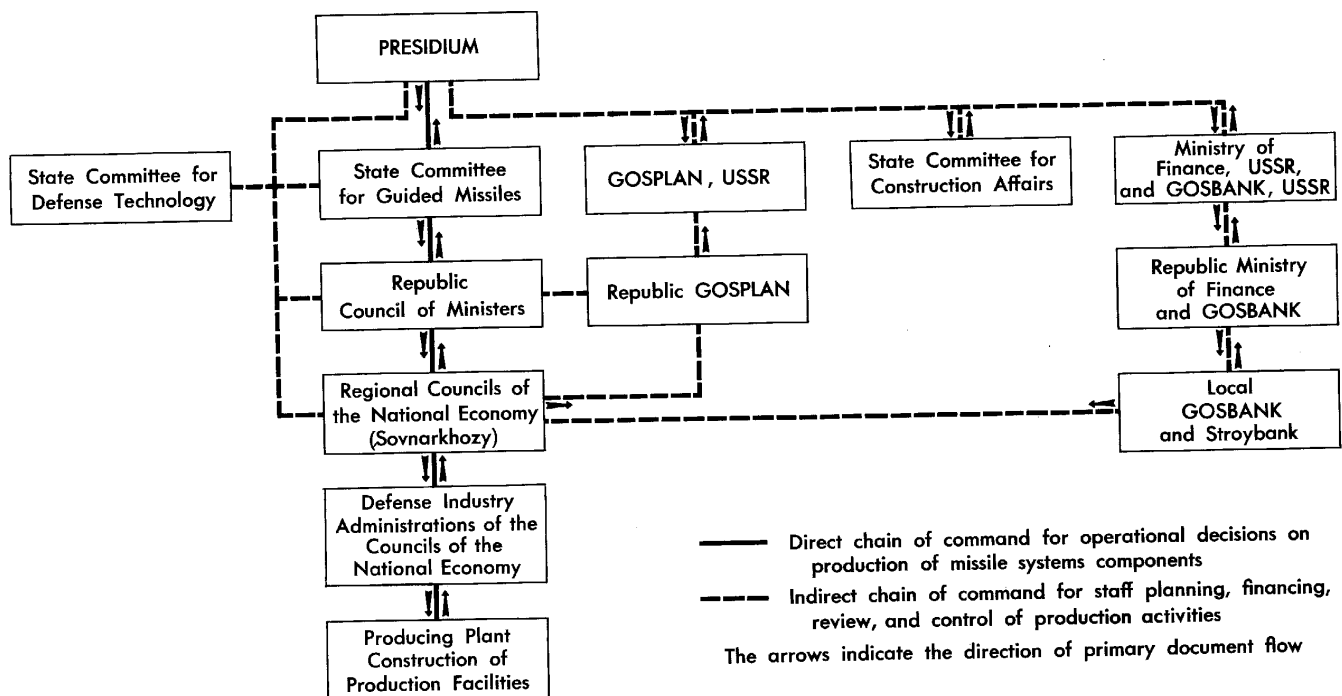
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Figure 5

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USSR: STAGE II PRODUCTION:
PROBABLE STRUCTURE OF OPERATIONAL CONTROL OF SERIAL
PRODUCTION FACILITIES OF A MISSILE SYSTEM*



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with the decisions of the Presidium and/or the individual in charge of the missile program or on the basis of a recommendation of Gosplan and/or the State Committee for Guided Missiles. If the changes are substantial, the plant concerned usually is notified so that it may present its objections, and some negotiation takes place. After the plan review by the Missiles Committee and Gosplan and a final decision by the Presidium, the plans are passed back down to the appropriate lower organs and finally to the original plant, with one or possibly two copies remaining in Moscow.

Production goals for each plant are passed to the Central Statistical Administration and also appear in the information passed to the Ministry of Finance and to Gosbank. These organizations pass the appropriate information for individual plants and installations to their respective local branches. The Ministry of Defense, of course, is informed. Thus planned complete details on the production of missile system elements are available in Moscow at the appropriate State Committee responsible for the industry to which the producing plants belong, the Presidium, the Ministry of Defense, the State Committee for Guided Missiles, Gosplan, the Central Statistical Administration, the Ministry of Finance, Gosbank, and possibly in the economic section of the Central Committee Secretariat.

Outside Moscow the information may be available in the republic Councils of Ministers and the republic Gosplans and is available in the sovnarkhozy for plants and installations located in each region. The oblast branch of the Central Statistical Administration, the local Gosbank, and possibly the local branches of the Ministry of Finance will receive a considerable volume of information but largely in value terms. Local organs of the Commission of Soviet Control would have access to all information concerning production in case of an inspection of a producing plant, and senior officials in the oblast Party committee might have access to the information. The lower levels, of course, have access to information concerning only the plans in their respective areas of jurisdiction.

As has been pointed out previously in the case of series production, the railroads, indirectly but unavoidably, have access to a great deal of information about production.

Production accounting would proceed in a similar manner. Production reports normally are sent to the next higher echelon, which in turn transmits the information to the central organs and/or Council of Ministers every 10 days. In the case of missile system elements, production reports probably are telegraphed to Moscow daily either by the plant directly or by the defense section of the sovnarkhoz. Similar reports are made to the defense section of the oblast branch of the

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Central Statistical Administration, which records the information and forwards it to the central office in Moscow. Reports passed to the oblast statistical office, however, apparently state only the ruble value of production but do not specify production in physical units. In the course of financial accounting, actual production data are available in detail to the defense section of the local Gosbank branch which handles the accounts of the producing enterprises. All purchases, sales, wage payments, and the like are recorded in these accounts on the basis of a mass of detailed accounting documents.

More detailed reports of production, costs, labor productivity, and the like are made monthly, quarterly, semiannually, and annually. These reports are made through the same hierarchy as the short-term reports, and again the local Gosbank and statistical office are the principal recipients outside the direct chain of command -- the defense industry section in the sovnarkhoz. The republic Council of Ministers and the republic Gosplan very likely receive information from the production reports covering a month or more. The local office of the inspection administration of the Ministry of Finance as well as senior officials of the oblast Party Committee probably have access to actual production statistics from time to time, as would representatives of the Commission for Soviet Control in case of an inspection.

It should be remembered that for the most part the detailed information on missile production which is forwarded to the sovnarkhozy and to other local organs will receive special handling and will be available only to personnel working in the defense industry sections of these organizations, and possibly only to the people in a subsection for production of missile system components. Beyond those working in the defense sections, the information is available only to a few senior officials in the local Gosbank, statistical office, and the sovnarkhoz. Large numbers of personnel in nondefense sections, however, apparently have access to totals for the area and the subtotals for the nondefense industry sectors.

Planning and accounting of construction activity are handled in a more or less analogous manner. If construction is being carried on to expand plant capacity, the "title list" forwarded to higher authorities provides detailed information about construction comparable to the production data in the technical-industrial-financial plan. Indeed, the "title list" goes the technical-industrial-financial plan one better in that the latter is limited to 1 year, whereas the former includes a general picture of the cost and size of the entire construction project from initiation to completion. As in the case of the technical-industrial-financial plan, the "title list" is handled by the defense sections of the sovnarkhozy, the republic Council of Ministers, the republic Gosplan, and finally by Gosplan, USSR. Key information is extracted from the "title list" for the use of the defense

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sections of the Statistical Administration, the branch, and the sales and supply organs.

It is likely that construction projects for major missile deployment installations are carried on by special military construction organizations directly subordinate to a central organization in Moscow, either to the Ministry of Defense or the Ministry of Transport Construction in most cases. In this case, it is possible that some of the lower and intermediate organs are cut out of the information flow. The Gosbank and the sales and supply organs, however, remain responsible for funding and for the delivery of material supplies to the construction organizations. Furthermore, a great deal of information becomes available to the railroads (see 4, below).

2. Financial Planning and Accounting

The Soviet system relies very heavily on "control by the ruble" to insure that enterprises fulfill the production and construction assignments in accordance with the goals and means specified in the plan. "Control by the ruble" means a detailed, up-to-the-minute, overlapping financial accounting of all activities of an enterprise which involve the acquisition and expenditure of resources and the sale of final product. The most important instruments for "control by the ruble" are the financial balances of the enterprises and the various accounts which the enterprise maintains in Gosbank and in the Stroybank.*

One of the most important instruments of financial control is the balance of income and expenditure which each enterprise must prepare monthly, quarterly, and yearly. These balances report all investment, value of fixed capital, amortization, all purchases of material inputs, all sales of output, stocks of inputs, finished and unfinished products on hand, and the monetary balance of credit and debit accounts in the banks -- including allocations from the budget. Each enterprise and organization engaged in production of missile system components presents such a balance to (a) the immediately superior organization which in most cases is the regional sovnarkhoz, (b) the branch of Gosbank and/or the Stroybank where the enterprise has its accounts, (c) the Central Statistical Administration -- either local or republic branches as specified by the home office in Moscow -- and (d) a copy to Gosplan.

The sovnarkhoz reviews the monthly and quarterly balances of all subordinate enterprises and organizations and presents an annual

* The Stroybank specializes in capital investment activities in contrast to the broad and generalized functions of Gosbank.

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review to the Council of Ministers of the republic. Copies are sent to the republic Ministry of Finance and to the republic Gosplan. For plants engaged in the missile program the sovnarkhoz almost certainly sends a copy to Gosplan.

For financial control of the day-to-day production activities of a plant connected with the missile program, the principal instrument is the plant's raschetnyy schet in the local Gosbank. This account may be thought of as divided into two parts (on the debit side): working capital for the purchase of materials, fuel, power, and the like, and the wage account, which is a cash account maintained primarily to cover wage payments. Working capital funds come primarily from the plant's own working capital fund, but a certain amount comes from short-term credits from the bank and from budget grants. As holder of the working capital account and the source of short-term credit, Gosbank monitors and controls all direct agreements (for sales and purchases between the plant and various consumers) and the terms and purposes thereof. The bank is equally responsible for monitoring wage payments.

On the credit side of the raschetnyy schet the bank receives a copy of the invoices (schet-faktura), the "payment demands," and records the payments received for the plant's output. These documents and accounts provide complete detail on the quantity, price, and location of purchaser for all sales by the plant. Thus the local Gosbank can and does make a complete audit of the activities of a missile plant from the information and documentation physically located in the plant's raschetnyy schet at the bank.

If the plant happens to be receiving subsidies from the State Budget, the local Gosbank branch is the official disbursing agent.

Enterprises carrying out capital construction and construction organizations are required to present to the Stroybank a monthly accounting of all funds expended on capital construction. The accounting specifies the sources of the funds, which are (a) amortization accounts with the Stroybank into which the plant pays a deduction calculated as a percentage of its fixed capital, (b) retained profits of the enterprise, and (c) grants from the Soviet budget. Furthermore, the "payment demands" and schet-faktura accompanying all materials and capital equipment destined for capital investment are stamped accordingly and are handled by the Stroybank. Thus the Stroybank has a complete record of all new construction activity.

Khozraschet enterprises are required to pay profits and other taxes into the State Budget. Payments are made through the Gosbank facilities, but the primary responsibility for assessing and

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insuring collection rests with the rayon and city branch offices of the Ministry of Finance. Enterprises and organizations are obligated to make an accounting to the financial organs for the established taxes and to make available to the financial organs all the documents necessary to determine the correctness of the sums calculated as owed to, and actually paid to, the budget. The financial organs are responsible for insuring that the amount of the taxes is correct and that payment is made on time. This means that the local offices of the Ministry of Finance have a record of all production and construction activity of the plant in monetary terms.

Construction of missile system installations carried out by construction units subordinate to the Ministry of Defense would report the details of their activities to the Ministry of Defense, Gosplan, and the Central Statistical Administration in Moscow. Local organs, however, would receive data on the aggregate ruble value of the construction and the wage bill and probably some additional data on labor and material inputs.

In addition to the controls and checks exercised through the day-to-day services which the banks provide the plants, the Ministry of Finance has an Inspection Administration with local branches for the purpose of periodic audits. The Inspection Administration audits not only the plant books but also the plant accounts with Gosbank and with the Stroybank. From time to time, therefore, the Inspection Administration has access to all pertinent information about the activities of a plant engaged in the missile program.

Thus the numerous and detailed checks and controls of the financial activities of a producing enterprise require that detailed information be made available to a number of organizations. The elements in the direct chain of command, from the plant engaged in the missile program, through the sovnarkhozy and the union republic organizations and finally to Moscow, have the information in the form of the technical-industrial-financial plan and in the periodic balances of income and expenditures. Gosbank and the Stroybank acquire all the details in the course of providing services and simultaneously checking the activities of the plant. Finally, the Inspection Administration of the Ministry of Finance conducts periodic audits. As in the case of production planning and accounting, of course, the financial activities of plants engaged in production of elements for missile systems are handled in special departments of these organizations. But a number of people outside the special departments have some information about the totals. Other people most likely to have access to information about the financial activity of a plant are the senior officials in the oblast Party and government committees.

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3. Supply and Sales

In the Soviet system of economic administration a plant's material inputs are carefully rationed to it on the basis of its production obligations and technological coefficients of input of materials to output of final product. The plant must request allocations of specific amounts of each material in accordance with its output goals, pass the requests to the higher echelons for review and approval, and then procure the materials within the approved limits through, or with the approval of, specialized supply organs. Similarly, the plant's output is disposed of through, or with the approval of, a specialized "sales" organization. Strict control, of course, is maintained for only the most important inputs, but such is the general scarcity of materials in the USSR that the most important ("deficit" or "funded") materials usually constitute more than three-quarters of the plant's material purchases.

When the plant prepares its technical-industrial-financial plan, the section on material supply includes a list of requisitions (*zayavka*) for each "funded" material, fuel, power, and type of capital equipment. When these requests are finally approved, usually after each successive higher echelon has pared the requests down somewhat, they are entered into the material balances of Gosplan and into the "plan for distribution" which is an integral part of the national economic plan. Within Gosplan, of course, the details of the work are carried on within the defense section, but the material requirements of the missile program must be entered into the material balances, and this is a separate section of Gosplan. Presumably the material requirements when transmitted by the defense section to the material balance section are presented in a sufficiently aggregative form so that any direct estimate of missile production would be difficult to derive. Similarly, the material supply plan for the union republics would contain the information in a comparable aggregative form for all plants and construction organizations in the republic. The same pattern is repeated at the level of the sovnarkhozy.

The plan for distribution promulgated by Gosplan contains detailed allocations of material inputs and capital equipment to each plant participating in the missile program. The documents specifying the allocations are transmitted to the appropriate specialized sales and supply organs as the basis for their relations with the producing enterprises. Under the new territorial organization of Soviet industry, the sales and supply organs remain very similar to the old sales and supply administrations of the abolished ministries -- that is, there is a sales-supply organ for each industry or group of industries, such as ferrous metals or fuel, and the specialized Main Administration for Supply of Armaments and Radiotechnical Industries. A group of

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about 20 sales-supply organizations is attached to Gosplan, and a comparable group to the republic Gosplans. Normally, if the transaction involves movement of supplies across the boundaries of a republic, the transaction comes under the jurisdiction of the Main Administration of Interrepublic Supply of Armaments and Radiotechnical Industries, which is subordinate to Gosplan. If the supplier and consumer are located in the same republic, the sales-supply organs attached to the republic Gosplan probably have jurisdiction in most instances. On the basis of the material distribution plan of the USSR and republic Gosplans, these sales-supply organs conclude general agreements covering anticipated monthly, quarterly, and yearly transactions with one another. Subsequently, the local sales-supply organs make the specific agreements for shipments to and from each plant. In many instances the agreements may be made directly between the supplier and the consumer, but the sales-supply offices have to approve such direct agreements which must be in accord with the limits approved in the technical-industrial-financial plan. Plants engaged in missile production normally would procure a large proportion of their supplies through direct agreements with the suppliers. In such cases the sales-supply organs would perform a monitoring function on the basis of copies of the direct agreements and detailed documentation of planned allocations.

Final products for the missile program probably are transferred directly from the plant to the Ministry of Defense. It is highly unlikely that a sales organ for missile systems exists. It is believed that the GAU acts as the agent of Ministry of Defense procurement. Representatives from the GAU inspect the final products to insure that technological specifications are met and instruct the local Gosbank to credit the plant's account and debit the account of the Ministry of Defense.

For ordinary material inputs the plants deal with the usual metals, fuel, and machinery sales-supply organs but with some deviations from normal procedures. Thus the allocations to plants involved in the missile program do not carry the usual detail which specifies, among other things, the nature and quantity of the final product. In the case of these plants the supply organs also may be excused from some of their normal responsibilities which include checking to see if the plant is using new capital equipment for the purposes specified in the plan. On the other hand, the available evidence suggests that a missile plant is subjected to the usual periodic checks of its material inventories, checks carried out by the supply organs in conjunction with the local Gosbank and the local statistical office. The aggregate amount of material supplies -- in physical units and monetary terms -- furnished to the plant is available in these organizations.

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4. Transport

The railroad administration has plans for shipment of material supplies to a plant engaged in series production up to 3 months before delivery. The railroad administration has complete documentation on all supply shipments, including the nature and quantity of the supplies, the price, and the designation of the supplier.

Similarly, the railroads are primarily responsible for shipment of finished components and for any special handling which may be required. The rolling stock used may belong either to the railroad or to the Ministry of Defense or to some other central organization. Serial numbers on the rolling stock may indicate the subordination and purpose of the car. All of the documentation on transport movement probably is handled by the VOSO unit in the railroad administration, but the nature of the movements involved probably is known to many workers and officials outside the special section.

5. Labor and Wages

One of the principal sections of the technical-industrial-financial plan is the section on planned number of workers, labor productivity, and wage bill. This is an area being given increasing attention by Soviet planners, and it can be assumed that the plant's proposals are reviewed carefully in each higher echelon. The number of workers, output per worker, and wage bill for all plants supporting the missile program probably are known only to the "First Branch" and the "Summary Defense Industry Branch" of Gosplan. Most, but probably not all, of the information on labor force, wage bill, and output per worker is available in the State Committee for Defense Industry. On the other hand, personnel in the regular labor section of Gosplan have available the total number of people engaged in defense production, labor productivity in defense industry, and the wage bill. Furthermore, the regular labor section very likely has some useful breakdown of these aggregates even if short of the specific figures for plants participating in the missile program.

Comparable information exists in the defense and in the regular sections of Gosplan at the republic level, and again at the level of the sovnarkhozy. It is possible, but by no means certain, that the Gosplan of the RSFSR and the Ukrainian SSR also have a "First" and "Second" Branch. At each of these levels, personnel in the defense industries section would have all the detailed information available, by plant, whereas those working outside the defense section would have only more generalized data.

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Distribution of the wage fund to the missile plants, of course, is handled by Gosbank; indeed, that is the principal purpose of the plant's cash account at Gosbank. Here again only those working in the defense section of Gosbank would have all the details, but it is likely that in Gosbank a number of other people in any local office would know the total cash which a particular plant withdrew for wage payments.

It is likely that the central trade union organizations in the union republic and in Moscow would know what proportion of the labor force is engaged in defense industry and construction but would not have much in the way of a detailed breakdown. The same is true of the trade union organs at the oblast level. At the rayon and city level, however, a trade union functionary might have more precise information purely by indirect means. Thus a rayon or city functionary almost certainly would know the total industrial labor force and wage bill in the rayon or city and the subtotal for nondefense industries. If there were only two or three defense industry plants in the rayon or city, one of which was engaged in production of missile system elements, the trade union functionaries might be able to determine the labor force and wage bill for the latter plant.

Figure 6* outlines the data and document flows for Phase II production and may be contrasted with Figure 4.**

6. Other Administrative Relationships

Local Party and government organs probably have access to a good deal of detailed information concerning the activities of plants engaged in series or mass production of missile system components. Such officials certainly would be aware of the time when new products went into production and when products were phased out and of other changes in the tempo and nature of a plant's activities.

C. Construction of Launching Sites and Operational Installations

Ballistic and surface-to-air defensive missiles may be launched from fixed or mobile ground facilities or from naval vessels. Information on the nature, number, and location of such installations is essential in order not only to determine the capabilities of installed systems but also to measure the economic cost of the program. The objectives of this section are to outline the organizational structure of a launching site construction program and to indicate how the problem of acquiring information on such a construction program differs from acquiring information on production of missile system components.

* Following p. 34.

** Following p. 22, above.

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1. Fixed and Mobile Ground Installations

Construction units engaged in building operational installations for ballistic or surface-to-air systems probably in most cases are special units subordinate to the Ministry of Defense. It is possible that some construction units may be subordinate to the Missiles Committee and to the Ministry of Transport Construction. The relationships of such construction units with local administrative and economic organs are minimal, roughly analogous to the relationships of a research institute or design bureau with local organs. On the other hand, the large quantities of material supplies which may be required and the physical nature of construction activities as distinct from production behind factory walls make the acquisition of information on installation construction somewhat easier than in the case of developmental production.

Planning and cost estimating of the construction of operational installations are carried out centrally by Gosplan with the consultation of the Missiles Committee, the State Committee for Construction Affairs, and the Ministry of Defense. Local organs will not have access to these plans and detailed cost estimates, but the aggregate value of construction work performed each year apparently is reported to a special section for defense activities of the appropriate sovnarkhoz. The same aggregative information apparently also is reported to the oblast office of the Central Statistical Administration. The detailed breakdown, however, probably exists only in the files of the construction organization itself and in the central offices of Gosplan, the Missiles Committee, and the Central Statistical Administration in Moscow. Republic and local organs are limited to annual or semiannual reports on the volume of construction activities in aggregative terms. These reports are, of course, handled by the classified sections of the local organs concerned.

Funding of construction of missile systems installations probably is handled in a manner analogous to financing research institutes engaged in developmental production. The construction organization has an account with the local Stroybank which shows the current allocations from the Soviet budget to the activity but which probably does not show the total expenditures from beginning to completion. The normal, detailed breakdown of construction expenditures also is lacking, although total wage payments may be broken out.

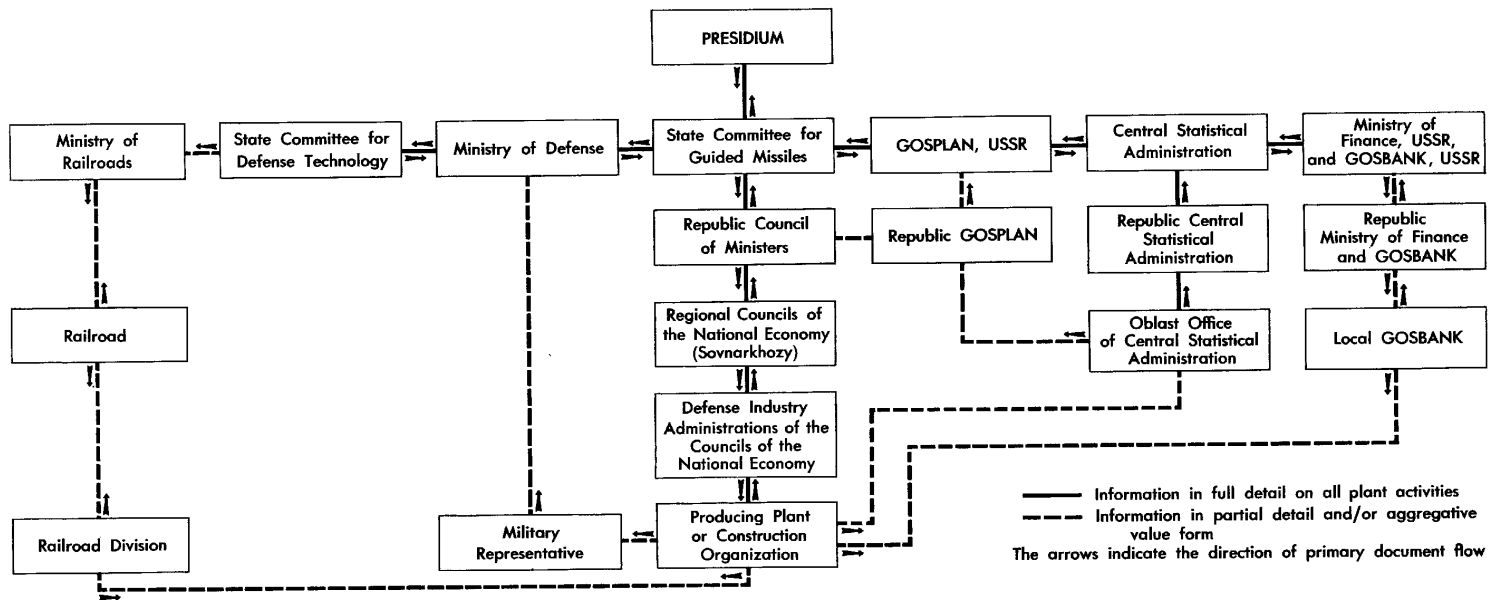
Construction units engaged in building installations recruit little, if any, of their labor locally. Local trade union officials have only limited contacts with the trade unions of the construction unit. The total labor force of the construction unit, however, apparently is reported to the defense activities section of the local

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Figure 6

USSR
STAGE II PRODUCTION: OPERATIONAL PLANNING AND CONTROL
Information and Document Flows



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sovnarkhoz on an annual or semiannual basis, and a similar report probably is submitted to the oblast office of the Central Statistical Administration.

Local Party and government officials have only limited knowledge of the launching facilities, but they certainly would be aware of the number of sites going into their area, the dates of initiation and completion, and to some extent the number of workers involved.

The local railroad office would have a great deal of information on the volume and kind of materials going into the construction of a site, the location of the site, and the dates of initiation and completion. If the launching site is a rail siding designed for use by special trains which carry the missile and launching facilities, a large number of people employed by the railroads would know a good deal about the installation. Construction of such facilities may be carried out by a construction unit subordinate to the Ministry of Defense or to the Ministry of Transport Construction.

Truck transport probably is not nearly as important as rail in the construction and operation of ballistic missile launching installations. For surface-to-air installations, however, truck transport may be quite important and in some cases may require the construction of unusually good roads such as the extensive concrete road network laid around Moscow. Such construction of sidings and roads cannot be easily hidden, and a great deal of information about it is available to local people.

Construction of rail sidings and modern automobile roads for launching installations is susceptible of observation by legal travelers.

2. Construction of Missile Launching Ships

A shipyard engaged in building a missile launching ship operates in a manner almost completely analogous to that of a plant engaged in series production of missile system components. A shipyard has essentially the same relationships with the central and local organs, and the same pattern of information flows, as a factory. The chief difference is that the production planning and accounting documents, as well as the financial documents, for naval construction will have a much longer time horizon, in that the total cost of the vessel as well as the expenditures to date are shown and in that the major planning and financial documents indicate whether the vessel is part of a series or a single experimental unit.

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